

REMARKS

Claims 1-8 are pending in this application.

Claim Rejections Under 35 USC § 103

Claims 1-3 and 5 were rejected under 35 U.S.C. §103(a) as being unpatentable over WO 2001/1088035 to Suzuki et al. (hereinafter referred to as Suzuki '139) in view of U.S. Patent No. 4,647,650 to Sasaki et al, and claims 1-2 and 4-8 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,583,208 to Suzuki (hereinafter referred to as Suzuki '208) in view of U.S. Patent No. 4,647,650 to Sasaki.. Applicants respectfully traverse these rejections.

Applicants hold that the Examiner's remarks in the Response to Applicants' Arguments section are unreasonable and illogical. "Rejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *KSR Int'l v. Teleflex, Inc.*, 550 U.S. 398, 82 USPQ2d 1385 (2007). Moreover, Applicants respectfully hold that the Examiner's articulated reasons for rejecting the present application in view of the remarks within the record do not support a legal conclusion of obviousness.

In the outstanding Office Action, the Examiner asserts Sasaki discloses that low acid value polymer produce high intrinsic viscosity polymers. See Office Action, page 5. Applicants respectfully disagree.

Sasaki merely discloses that “since an oligomer having an intrinsic viscosity $[\eta]$ of not more than 0.4 dl/g and a carboxyl terminal group concentration $[\text{COOH}]$ of not more than $90 \times [\eta]^{-0.4}$ $\mu\text{eq/g}$ is used, a polymer having a high intrinsic viscosity can be obtained.” See Sasaki, Col. 3, lines 40-45. When the carboxyl terminal group concentration is calculated with a concrete intrinsic viscosity under the above conditions, the results are as follows.

$$*\eta=0.4 \text{ dl/g; } 90 \times [\eta]^{-0.4} = 130 \mu\text{eq/g}$$

$$*\eta=0.1 \text{ dl/g; } 90 \times [\eta]^{-0.4} = 226 \mu\text{eq/g}$$

Thus, the acid value of the oligomer in Sasaki is not low at all.

Applicants respectfully hold that the cited art fails to render at least this feature of the presently claimed invention obvious.

In the outstanding Office Action, the Examiner acknowledges that the oligomers of Sasaki do have an acid value of 11 $\mu\text{eq/g}$, but then asserts that by extension, the polyesters formed necessarily have an acid value below this amount, as these polymers are condensation products of linear monomers (terephthalic acid and ethylene glycol). The Examiner asserts that “by doubling the weight (of a polymer), the acid value is halved.” See Office Action, page 6. Applicants respectfully disagree.

Sasaki discloses an acid value of 42 $\mu\text{eq/g}$ in Examples 4, 5 and 7 and an acid value of 11 $\mu\text{eq/g}$ in Comparative Example 6. See Sasaki, Examples 4, 5, and 7 and Comparative Example 6 of Table, Cols. 3 and 4. Namely, Sasaki only requires “use of an oligomer having a relation between an intrinsic viscosity $[\eta]$ of not more than 0.4 dl/g and a carboxyl terminal group

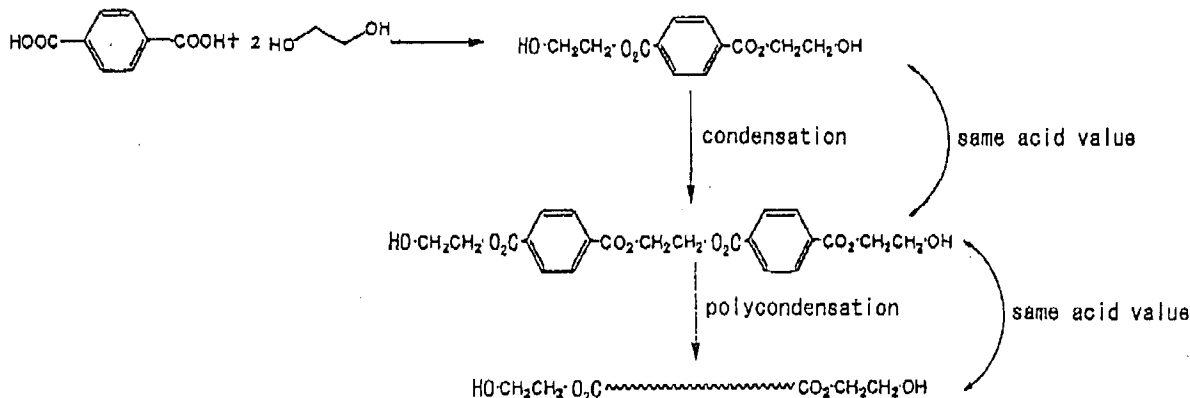
concentration $[\text{COOH}]$ of not more than $90 \times [\eta]^{-0.4} \mu\text{eq/g}$ ". However, Sasaki does not disclose, teach, suggest or provide any reason for or intend the use of a polyalkylene terephthalate resin having an acid value of not higher than $30 \mu\text{eq/g}$, as recited in the presently claimed invention. Moreover, even if oligomers having an acid value of $11 \mu\text{eq/g}$ were disclosed, the polyesters formed do not necessarily have an acid value below $11 \mu\text{eq/g}$. This will be further clarified below.

The following explanation will clarify the reasoning that Sasaki discloses a higher molecular weight.

The Examiner's position is based on the premise that higher molecular weight polymers have lower acid values. However, this position by the Examiner is only reasonable if the following two assumptions are true: i) both ends of the obtained polymer are necessarily terminated by carboxyl groups, and ii) the only esterifying reaction is conducted without any side reactions.

Regarding the first assumption:

The polymerization of polyesters is usually conducted after synthesizing bishydroxyalkylester by esterification or interesterification. See the following scheme. Therefore, it is not reasonable or logical to assume that both ends of the obtained polymer are terminated by carboxyl groups.



Since the first assumption may not be true, then the Examiner's premise, that higher molecular weight polymers have lower acid values, may also not be true.

Regarding the second assumption:

During the polymerization of polyesters, side reactions such as thermolysis, degradation by oxidation, and hydrolysis usually occur to give a lot of carboxylic acids. This is known in the art. Therefore, even if the first assumption is applicable, acid values are lowered by increasing polymers molecular weight only at the beginning of the polymerization. Since side reactions occur with high possibility at the ending of the polymerization, it is meaningless to discuss the acid value based on only end groups of the polymers, and it is necessary to discuss the acid value with considering carboxylic acids generated by side reactions.

Accordingly, the Examiner's insistence of lowering acid values by increasing polymers molecular weight would only warrant consideration under the above limited assumptions, but the insistence is not realistic for discussing acid values in the conventional polyester polymerization. Consequently, in the conventional polyester polymerization, the acid value usually rises at the

ending of the polymerization, because carboxyl groups are generated by side reactions. Namely, the acid values of polymers are usually higher than those of oligomers.

Since the second assumption may not be true, then the Examiner's premise may also not be true.

Applicants respectfully hold that the Examiner's position is illogical and unreasonable. Applicants respectfully request reconsideration and withdrawal of the rejection.

In the outstanding Office Action, the Examiner asserts that the features of the claimed invention upon which Applicants rely upon, i.e., degradation upon melt processing, are not recited in the rejected claim(s) and thus do not provide a basis for patentability. See Office Action, page 7. Applicants respectfully disagree.

Features of a product may be described in the claims, but it is not necessary to describe the unexpected effect, i.e., the generation of low-molecular substances due to degradation upon melt processing is suppressed, in claims. A product may be unobvious because of the discovery in it of unobvious properties, because the properties inhere in the product. *In re Papesch*, 137 USPQ 43 (CCPA 1963). The Court in *Papesch* did not require that the claims recite the unexpected properties of the invention.

Furthermore, in the outstanding Office Action, the Examiner asserts that improvements in melt-processing, crystallization, shrinkage inhibition and surface gloss, are merely advantages that would flow naturally from the suggestions of the cited art and thus cannot form a basis for

patentability since the differences would be otherwise obvious. See Office Action, page 5. Applicants respectfully disagree.

The features of the presently claimed invention would not flow naturally from the suggestions of the cited art. The unexpected improvements in melt-processing, crystallization, shrinkage inhibition and surface gloss of the presently claimed invention are unobvious and unexpected from the cited art and thus do provide a basis for patentability.

In the outstanding Office Action, the Examiner asserts the polymers of the presently claimed invention appear to be substantially identical to those of Suzuki '139 and Suzuki '206, based on intrinsic viscosity, which is indicative of acid value and molecular weight, as taught by Sasaki. See Office Action, page 7. Applicants respectfully disagree.

Sasaki discloses an intrinsic viscosity $[\eta]$ of not more than 0.4 dl/g, and Suzuki '139 discloses a logarithmic viscosity of 0.3-2.0 dl/g, and Suzuki '208 discloses a logarithmic viscosity of 0.4-2.0 dl/g after step (D). See Suzuki '208 Col. 19, lines 36-45. Thus, the types of viscosity and ranges of the viscosity are completely different and unobvious between Sasaki, Suzuki '208 and Suzuki '139. Moreover, there is usually no relationship between an intrinsic viscosity and an acid value. Furthermore, polyesters having similar viscosities can have different acid values by shortening the thermal history in the step of polymerization, as seen in the specification of the presently claimed invention. This is supported at least in the disclosure on page 6, lines 28-30 and in Production Examples 1 and 2 (polyester resins A1 and A2) and

Production Examples 4 and 6 (polyester resins A4 and A6) on pages 30-33 in the present specification.

Accordingly, the articulated reasoning for rejecting the presently claimed invention by the Examiner does not have a rational underpinning to support a legal conclusion of obviousness. Since the reasoning for rejecting the presently claimed invention is illogical and unreasonable, Applicants respectfully request reconsideration and withdrawal of the rejections.

In light of the illogical and/or unreasonable conclusions presented in the outstanding Office Action, Applicants respectfully request reconsideration of the Remarks presented in the Amendment filed on October 6, 2009 and herein presented.

The presently claimed invention relates to a polyester resin composition which comprises a polyalkylene terephthalate resin having an acid value of not higher than 30 $\mu\text{eq/g}$ and a layered compound.

The polyalkylene terephthalate resin has a low acid value not exceeding 30 $\mu\text{eq/g}$, by which the generation of low-molecular substances due to degradation upon melt processing is suppressed, and the crystallization promoting and shrinkage inhibiting effects of the layered compound finely dispersed therein, are combined together, so that the surface gloss can now be maintained at high levels even upon long-period exposure to elevated temperatures. See present specification, page 24, line 28-page 25, line 1. This is an unexpected feature of presently claimed invention, which may be achieved by the combination of the low acid value and the layered compound.

On the other hand, Suzuki '139 discloses a polyester resin composition comprising a thermoplastic polyester resin and a polyether compound-treated layered material having layers respectively exfoliated by one another. The object of Suzuki '139 is to provide a polyester resin composition capable of providing moldings well balanced among physical characteristics with suppression of reduction in strength of moldings.

Sasaki discloses a process for producing polyester comprising an ethylene terephthalate repeating unit, which comprises producing an oligomer having an intrinsic viscosity $[\eta]$ of not more than 0.4 dl/g and a carboxyl terminal group concentration of not more than $90X[\eta]^{-0.4}$ $\mu\text{eq/g}$, feeding the oligomer to a final polymerization reactor, heating, dispersing and polymerizing the oligomer in the form of fine molten particles. The object of Sasaki is providing a process for rapid polymerization of polyester having a high intrinsic viscosity.

Suzuki '208 discloses a polyester resin composition comprising a thermoplastic polyester resin and a silane-treated foliated phyllosilicate. The object of Suzuki '208 is to provide resin molded articles having improved flexural properties, deflection temperature under load and dimension stability.

It is acknowledged in the Office Action that neither Suzuki '139 nor Suzuki '208 discloses the acid value of the polyester resin being not higher than 30 $\mu\text{eq/g}$. Neither Suzuki '139 nor Suzuki '208 disclose, teach, suggest or provide any reason for achieving this feature of the presently claimed invention.

Moreover, Sasaki only describes that the ester oligomer, which is a material used for producing a polyalkylene terephthalate resin, has an acid value of 11 $\mu\text{eq/g}$. Sasaki does not disclose the acid value of a polyalkylene terephthalate resin. As disclosed in the present specification, the acid value tends to increase during polymerization. Thus, Sasaki does not disclose, teach, suggest or provide any reason for the acid value of the polyalkylene terephthalate resin being not higher than 30 $\mu\text{eq/g}$.

Furthermore, Sasaki discloses a polyester having a high intrinsic viscosity by using an oligomer having a specific intrinsic viscosity and carboxyl terminal group concentration. However, Sasaki does not disclose, teach, suggest or provide any reason for the generation of low-molecular substances due to degradation upon melt processing being suppressed by using the polyalkylene terephthalate resin having a low acid value of not higher than 30 $\mu\text{eq/g}$.

Suzuki '139, Suzuki '208 and Sasaki do not disclose, teach, suggest or provide any reason for the acid value of the polyester resin being not higher than 30 $\mu\text{eq/g}$, either independently or in combination with one another.

Moreover, none of the cited references disclose, teach, suggest or provide any reason for the surface gloss being maintained at high levels even upon long-period exposure to elevated temperatures by the combination of the low acid value and the layered compound, which is an unexpected feature of the presently claimed invention.

Accordingly, the presently claimed invention would not have been obvious to one of ordinary skill in the art at the time of invention from the combined disclosure of any of the above references.

For at least the foregoing reasons, the claimed invention distinguishes over the cited art and defines patentable subject matter. Favorable reconsideration is earnestly solicited.

In view of the above, Applicants respectfully submit that their claimed invention is allowable and ask that the rejections under 35 U.S.C. §103 be reconsidered and withdrawn. Applicants respectfully submit that this case is in condition for allowance and allowance is respectfully solicited.

If any points remain at issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the local exchange number listed below.

Application No. 10/582,584
Art Unit: 1796

Request For Reconsideration Under 37 C.F.R. §1.116
Attorney Docket No. 062537

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

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